THE JOURNAL OF CHEMICAL THERMODYNAMICS

Volume 14, 1982

EDITORS

M. L. McGlashan
Department of Chemistry
University College London
20 Gordon Street
London WC1H 0AJ
U.K.

G. T. Armstrong†
Thermochemical Measurements and Standards
National Bureau of Standards
Washington, D.C. 20234
U.S.A.
† *Died 9 March 1982*

P. A. G. O'Hare
Argonne National Laboratory
Chemical Technology Division
Argonne
Illinois 60439
U.S.A.
from 1 May 1982

Assistant Editor: **M. B. Ewing** (University College London, U.K.)

ADVISORY BOARD

Chairman: G. M. Schneider (F.R.G.)

D. Ambrose (U.K.)
G. C. Benson (Canada)
M. Colomina (Spain)
J. I. Gerassimov (U.S.S.R.)
L. G. Hepler (Canada)
C. E. Holley, Jr. (U.S.A.)
O. J. Kleppa (U.S.A.)
M. Månsson (Sweden)
F. Pavese (Italy)
G. Pilcher (U.K.)
L. A. K. Staveley (U.K.)
J. Stecki (Poland)
H. Suga (Japan)
E. F. Westrum, Jr. (U.S.A.)
A. G. Williamson (N.Z.)

ACADEMIC PRESS
London New York Toronto
Sydney San Francisco
A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1982 Academic Press Inc. (London) Limited

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 14

Number 1, January 1982

ELSEMONGY, M. M.; FOUDA, A. S. Thermodynamic studies of hydrobromic acid in (ethylene glycol + water) from electromotive-force measurements . 1

TANIEWSKA-OSIŃSKA, S.; PAŁECZ, B. Enthalpies of solution of hydroxyurea in water in the temperature range 293.15 to 323.15 K 11

MAYRATH, J. E.; WOOD, R. H. Enthalpy of dilution of aqueous sodium chloride at 348.15 to 472.95 K measured with a flow calorimeter 15

GRIGG, R. B.; GOATES, J. R.; OTT, J. B.; THOMAS, D. L. Excess volumes of cyclohexane + 2-methylpentane, + 3-methylpentane, and + methyl cyclopentane 27

WILHELM, E.; INGLESE, A.; GROLIER, J.-P. E.; KEHIAIAN, H. V. Thermodynamics of binary mixtures containing cyclic ethers. 4. Excess enthalpies of oxolane + and oxane + alkanoic acid (HCO_2H to $C_7H_{15}CO_2H$) 33

CASTAGNOLO, M.; INGLESE, A.; PETRELLA, G. Enthalpies of solution of tetra-*n*-butylammonium and tetra-*n*-pentylammonium bromides in (water + sulfolane) at 303.15 K 37

SURADI, S.; EL SAIAD, N.; PILCHER, G.; SKINNER, H. A. Enthalpies of combustion of the three hydroxy-pyridines and the four hydroxy-2-methylpyridines 45

DYMOND, J. H.; ROBERTSON, J.; ISDALE, J. D. (p, ρ, T) of some pure *n*-alkanes and binary mixtures of *n*-alkanes in the range 298 to 373 K and 0.1 to 500 MPa 51

AMBROSE, D. Publications in the field of chemical thermodynamics by the Division of Chemical Standards at N.P.L. 61

RAU, H. The solubility of HCl in $SiCl_4$ 77

DE LOOS, TH. W.; PENDERS, W. G.; LICHTENTHALER, R. N. Phase equilibria and critical phenomena in fluid (*n*-hexane + water) at high pressures and temperatures 83

KUMARAN, M. K.; HEDWIG, G. R.; WATSON, I. D. The relative partial molar enthalpies and apparent molar volumes of aqueous solutions of L-alanylglycine and of DL-alanylglycine 93

NOTES

PINTOS, M.; BRAVO, R.; PEREZ VILLAR, V.; PAZ ANDRADE, M. I. Excess molar properties at 298.15 K of bis(2-chloroethyl) ether + *n*-hexane, + *n*-heptane, and + *n*-octane 99

GRIGG, R. B.; GOATES, J. R.; OTT, J. B. Excess volumes and excess enthalpies for (*n*-dodecane + *n*-octane) and excess volumes for (*n*-dodecane + cyclohexane) at 298.15 K 101

Number 2, February 1982

ERASTOV, P. A.; KOLESOV, V. P. Enthalpy of formation of trifluorochloroethene 103

OETTING, F. L.; WEST, E. D. An adiabatic calorimeter for the range 300 to 700 K 107

SMITH, C. M.; HODGES, A. E., III; HASCHKE, J. M.; OETTING, F. L. The chemical thermodynamics of nuclear materials. VI. (Plutonium + hydrogen) 115

CARLING, R. W.; WONDOLOWSKI, A. T.; MACMILLAN, D. C. Enthalpy of formation of $CaCl_2 \cdot 2CH_3OH$ and $CaCl_2 \cdot 2C_2H_5OH$ by solution calorimetry 125

KLEPPA, O. J.; SATO, S. New applications of high-temperature solution calorimetry. III. Enthalpies of formation of Mn_2B, MnB, and MnB_2 . 133

TOUHARA, H.; OKAZAKI, S.; OKINO, F.; TANAKA, H.; IKARI, K.; NAKANISHI, K. Thermodynamic properties of aqueous mixtures of hydrophilic compounds. 2. Aminoethanol and its methyl derivatives . 145

JESCHKE, P.; SCHNEIDER, G. M. Phase equilibria in binary mixtures containing fluorocarbons at high pressures and low temperatures. IV. Liquid–liquid and liquid–solid equilibria for (krypton + trifluoromethane) up to 200 MPa 157

KEMORI, N.; KATAYAMA, I.; KOZUKA, Z. Thermodynamic properties and solubility limits of oxygen in liquid (nickel + copper) alloys . . . 167

LETCHER, T. M.; SCOONES, B. W. H. Excess volumes of tetrahydronaphthalene + cyclopentane, + cyclohexane, + cycloheptane, and + cyclooctane at two different temperatures 185

LETCHER, T. M. The excess volumes of bicyclohexyl + *n*-pentane, + *n*-hexane, and + cyclopentane at 283.15 and 298.15 K 189

TIMBERG, L.; TOGURI, J. M. A thermodynamic study of (copper + chromium) by mass spectrometry 193

Number 3, March 1982

KRUIF, C. G. DE; BLOK, J. G. The vapour pressure of benzoic acid . . 201

KHRIPLOVICH, L. M.; KHOLOPOV, E. V.; PAUKOV, I. E. Heat capacity and thermodynamic properties of Co_3O_4 from 5 to 307 K. Low-temperature transition 207

VANDERZEE, C. E. Thermodynamic relations and equilibria in (Na_2CO_3 + $NaHCO_3$ + H_2O): standard Gibbs energies of formation and other properties of sodium hydrogen carbonate, sodium carbonate heptahydrate, sodium carbonate decahydrate, trona: ($Na_2CO_3 \cdot NaHCO_3 \cdot 2H_2O$), and Wegscheider's salt: ($Na_2CO_3 \cdot 3NaHCO_3$) 219

ZAWISZA, A.; VEJROSTA, J. High-pressure liquid-vapour equilibria, critical state, and $p(V, T, x)$ up to 573.15 K and 5.066 MPa for (heptane + propan-1-ol) 239

VILLAMAÑAN, M. A.; CASANOVA, C.; ROUX, A. H.; GROLIER, J.-P. E. Calorimetric investigation of the interactions between oxygen and hydroxyl groups in (alcohol + ether) at 298.15 K 251

TANAKA, R. Determination of excess heat capacities of (benzene + tetrachloromethane and + cyclohexane) between 293.15 and 303.15 K by use of a Picker flow calorimeter 259

SAKURAI, M.; NAKAGAWA, T. Densities of dilute solutions of water in benzene and in methanol at 278.15, 288.15, 298.15, 308.15, and 318.15 K. Partial molar volumes V_w and values of $\partial V_w/\partial T$ for water in benzene and in methanol. 269

BONNER, O. D. The osmotic and activity coefficients of lithium, sodium, and potassium trifluoroacetates and a discussion of the ionization of trifluoroacetic acid 275

CHOUDHURY, N. R.; AHLUWALIA, J. C. Temperature dependence of heat capacities of sodium decanoate, sodium dodecanoate, and sodium dodecyl sulphate, in water 281

NEWSHAM, D. M. T.; MENDEZ-LECANDA, E. J. Isobaric enthalpies of vaporization of water, methanol, ethanol, propan-2-ol, and their mixtures 291

Number 4, April 1982

WILHELM, E.; INGLESE, A.; QUINT, J. R.; GROLIER, J.-P. E. Molar excess volumes and excess heat capacities of (1,2,4-trichlorobenzene + an *n*-alkane) 303

POLO, C.; OTIN, S.; GUTIERREZ LOSA, C. Thermodynamic properties of organic oxygen compounds. Excess enthalpies for (cycloalkanone + cycloalkane) 309

CORDFUNKE, E. H. P.; MUIS, R. P.; OUWELTJES, W.; FLOTOW, H. E.; O'HARE, P. A. G. The thermodynamic properties of Na_2UO_4, $Na_2U_2O_7$, and $NaUO_3$ 313

O'HARE, P. A. G.; MALM, J. G.; ELLER, P. G. Thermochemistry of uranium compounds. XII. Standard enthalpies of formation of the α and β modifications of uranium pentafluoride. The enthalpy of the β-to-α transition at 298.15 K 323

O'HARE, P. A. G.; MALM, J. G. Thermochemistry of uranium compounds. XIII. Standard enthalpies of formation at 298.15 K of α-uranium oxide tetrafluoride (UOF_4) and uranyl fluoride (UO_2F_2). Thermodynamics of (uranium + oxygen + fluorine) 331

STEELE, W. V.; APPLEMAN, E. H. The standard enthalpy of formation of peroxymonosulfate (HSO_5^-) and the standard electrode potential of the peroxymonosulfate-bisulfate couple. 337

RAU, H. The solubility of HCl in $GeCl_4$ 345

CASH, W. M.; BROOKS, C. R. The heat capacity of α-titanium from 320 to 1020 K 351

JACKOWSKI, A. W. Solid–liquid equilibria in four examples of (an unsaturated hexane + a chloromethane) at ordinary pressures 357

VIENRAVEE, T.; MILLER, R. C. Excess volumes and compressibilities derived from dielectric-constant measurements for liquid mixtures of Ar, CH_4, and C_2H_6 from 115 to 130 K at pressures to 35 MPa 361

MORSS, L. R.; FUGER, J.; JENKINS, H. D. B. Thermodynamics of actinide perovskite-type oxides. I. Enthalpy of formation of Ba_2MgUO_6 and Ba_2MgNpO_6 377

MCLURE, I. A.; NEVILLE, J. F. The critical temperatures and pressures of hexamethyldisilmethylene, octamethylcyclotetrasiloxane, and decamethylcyclopentasiloxane 385

ROY, K. N.; PRASAD, R.; VENUGOPAL, V.; SINGH, Z.; SOOD, D. D. Studies on ($2UF_4+H_2 = 2UF_3+2HF$) and vapour pressure of UF_3 389

JOCHEMS, R.; DEKKER, H.; MOSSELMAN, C.; SOMSEN, G. The use of the LKB 8721–3 Vaporization Calorimeter to measure enthalpies of sublimation. The enthalpies of sublimation of bicyclo[2.2.1]hept-2-ene (norbornene), bicyclo[2.2.1]heptane (norbornane), and tricyclo-[3.3.1.$1^{3,7}$]decane (adamantane) 395

NOTES

TAKENAKA, M.; TANAKA, R.; MURAKAMI, S. Molar excess volumes of (benzene + *n*-heptane) between 293.15 and 303.15 K by use of a vibrating densimeter 399

McLure, I. A.; Trejo Rodriguez, A.; Soares, V. A. M. Critical temperature and pressure of decafluoro-2-methylpropane 402

Number 5, May 1982

OBITUARY: Armstrong, G. T. i

Meyer, E. F.; Zielinski, W. M. Thermodynamics of solution of 1-, 2-, and 3-hexyne, and 1,5- and 2,4-hexadiyne in *n*-tetracosane, *n*-nonadecylcyclohexane, di-*n*-dodecyl ether, and di-*n*-dodecyl thioether at 349.15 K using gas-liquid chromatography 403

Wijbenga, G.; Cordfunke, E. H. P. Determination of standard Gibbs energies of formation of URh_3 and URu_3 by solid-state e.m.f. measurements . 409

Besmann, T. M.; Lindemer, T. B. High-temperature equilibrium between uranium dicarbide, uranium dioxide, carbon, and carbon monoxide . 419

Notin, M.; Gachon, J. C.; Hertz, J. Enthalpy of formation of Al_4Ca and Al_2Ca and of the liquid alloys (aluminium + calcium) 425

Wren, D. J.; Vikis, A. C. Vapour pressure of CH_3I in the temperature range 176 to 227 K 435

McLure, I. A.; Trejo Rodriguez, A. Excess functions for (*n*-alkanenitrile + *n*-alkane) liquid mixtures. 2. Excess enthalpies at 298.15 K for propanenitrile and *n*-butanenitrile with some C_5 to C_{14} *n*-alkanes . . 439

Gomez, M.; Chatillon, C.; Allibert, M. Thermodynamics of gaseous and condensed indium oxides by mass spectrometry with controlled oxygen pressure 447

Imperatori, P.; Ferro, D.; Piacente, V. Sublimation study of $BiCl_3$ and of $BiBr_3$ 461

Roy, R. N.; Gibbons, J. J.; Trower, J. K.; Lee, G. A.; Hartley, J. J.; Mack, J. G. The ionization constant of carbonic acid in solutions of sodium chloride from e.m.f. measurements at 278.15, 298.15, and 318.15 K . 473

Wijbenga, G. The enthalpy of formation of UPd_3 by fluorine bomb calorimetry 483

Cordfunke, E. H. P.; Ouweltjes, W.; Prins, G. Standard enthalpies of formation of uranium compounds. VIII. UCl_3, UCl_5, and UCl_6 . . 495

Number 6, June 1982

Pikkarainen, L. Excess volumes of (*N*-methylmethanesulfonamide + an aliphatic alcohol) 503

McFall, T. A.; Post, M. E.; Christensen, J. J.; Izatt, R. M. The excess enthalpies of (1-butene + methyl *t*-butyl ether), (1,3-butadiene + propene), and (carbon disulfide + methanol) as functions of temperature 509

Wilhelm, E.; Inglese, A.; Grolier, J.-P. E.; Kehiaian, H. V. Thermodynamics of binary mixtures containing cyclic ethers. 5. Excess enthalpies of 1,3-dioxolane +, and 1,4-dioxane + alkanoic acid (HCO_2H to $C_7H_{15}CO_2H$) 517

Grolier, J.-P. E.; Inglese, A.; Wilhelm, E. Excess volumes and excess heat capacities of tetrachloroethene + cyclohexane, + methylcyclohexane, + benzene, and + toluene at 298.15 K 523

Lavut, E. G.; Timofeyev, B. I.; Yuldasheva, V. M.; Galchenko, G. L. Enthalpy of formation of niobium pentachloride 531

Sarbar, M.; Covington, A. K.; Nuttall, R. L.; Goldberg, R. N. Activity and osmotic coefficients of aqueous nickel (II) nitrate solutions . . 537

Jeschke, P.; Schneider, G. M. Phase equilibria in binary mixtures containing fluorocarbons at high pressures and low temperatures. V. Liquid–liquid and gas–gas equilibria for tetrafluoromethane + propane and + butane up to 200 MPa 547

Arsuaga, J. M.; Castellanos, M. A.; Nuñez Delgado, J. Solubility of hexamminecobalt (III) hexacyanoferrate (III) in aqueous solutions of different electrolytes 555

Mayrath, J. E.; Wood, R. H. Enthalpy of dilution of aqueous solutions of LiCl, NaBr, NaI, KCl, KBr, and CsCl at about 373, 423, and 473 K . 563

Takagi, T.; Teranishi, H. Ultrasonic speeds and thermodynamic properties of (benzene + chlorobenzene) and (benzene + bromobenzene) under high pressures 577

Kokkonen, P. Excess volumes and excess enthalpies of triethylamine + *o*-xylene, + *m*-xylene, and + *p*-xylene 585

Lukas, W.; Gaune-Escard, M. Temperatures and enthalpies of melting of alkali-metal perrhenates 593

NOTES

Sangster, J.; Abraham, M.-C.; Abraham, M. Vapour pressures of $\{(1-x)(0.4888Ag + 0.4612Tl + 0.0500K)NO_3 + xH_2O\}$ at 371.7 K . 599

Kertes, A. S.; Lai, W. C. Enthalpies of solution of benzene, trichloromethane, and tetrachloromethane in liquid carboxylic acids 601

Number 7, July 1982

HAYNES, W. M. Measurements of orthobaric-liquid densities of multicomponent mixtures of LNG components (N_2, CH_4, C_2H_6, C_3H_8, $CH_3CH(CH_3)CH_3$, C_4H_{10}, $CH_3CH(CH_3)C_2H_5$, and C_5H_{12}) between 110 and 130 K 603

PEIPER, J. C.; PITZER, K. S. Thermodynamics of aqueous carbonate solutions including mixtures of sodium carbonate, bicarbonate, and chloride. . 613

CASTANET, R. Thermodynamic investigation on (a transition metal + germanium). I. (Platinum + germanium) and (palladium + germanium) alloys 639

LO SURDO, A.; ALZOLA, E. M.; MILLERO, F. J. The (p, V, T) properties of concentrated aqueous electrolytes. I. Densities and apparent molar volumes of NaCl, Na_2SO_4, $MgCl_2$, and $MgSO_4$ solutions from 0.1 mol·kg^{-1} to saturation and from 273.15 to 323.15 K 649

TASKINEN, A. Effect of In, Sn, and Te on the activity coefficient of oxygen in liquid lead 663

GARBAJOSA, J.; TARDAJOS, G.; AICART, E.; DÍAZ PEÑA, M. Isothermal compressibility of toluene + n-hexane and + n-octane at 298.15, 308.15, 318.15, and 333.15 K 671

MARTIN, J. F.; ANDON, R. J. L. Thermodynamic properties of organic oxygen compounds. Part LII. Molar heat capacity of ethanoic, propanoic, and butanoic acids. 679

JAIN, D. V. S.; SAINI, S. B.; SIDHU, R. S. Excess Gibbs free energies of methylcyclohexane + benzene, + methylbenzene, and + ethylbenzene at 303.15 and 323.15 K 689

SARBAR, M.; COVINGTON, A. K.; NUTTALL, R. L.; GOLDBERG, R. N. Activity and osmotic coefficients of aqueous potassium carbonate 695

Number 8, August 1982

LETCHER, T. M.; SCOONES, B. W. H. The excess enthalpies of bicyclohexyl + a cycloalkane and + an n-alkane at two temperatures 703

MURATA, S.; SAKIYAMA, M.; SEKI, S. Construction and testing of a sublimation calorimetric system using a Calvet microcalorimeter 707

MURATA, S.; SAKIYAMA, M.; SEKI, S. Enthalpy of sublimation of benzoic acid and dimerization in the vapor phase in the temperature range from 320 to 370 K 723

McLure, I. A.; Sipowska, J. T.; Pegg, I. L. Surface tensions of (an alkanol + an alkane). 1. Propan-1-ol + heptane 733

Jeschke, P.; Schneider, G. M. Phase equilibria in binary mixtures containing fluorocarbons at high pressures and low temperatures. VI. Liquid–solid equilibria for $\{(1-x)CF_4+xAr\}$, $\{(1-x)CF_4+xKr\}$, and $\{(1-x)CF_4+xXe\}$ up to 200 MPa 743

Easteal, A. J.; Woolf, L. A. Measurement of (p, V, x) for (water + acetonitrile) at 298.15 K 755

Schaake, R. C. F.; Miltenburg, J. C. van; Kruif, C. G. de. Thermodynamic properties of the normal alkanoic acids. I. Molar heat capacities of seven odd-numbered normal alkanoic acids 763

Schaake, R. C. F.; Miltenburg, J. C. van; Kruif, C. G. de. Thermodynamic properties of the normal alkanoic acids. II. Molar heat capacities of seven even-numbered normal alkanoic acids 771

Colomina, M.; Jimenez, P.; Turrion, C. Vapour pressures and enthalpies of sublimation of naphthalene and benzoic acid 779

Gidley, M. A.; Stubley, D. Phase diagrams of some mixtures of (a nematic liquid crystal + an ordinary liquid) 785

Kruif, C. G. de; Schaake, R. C. F.; Miltenburg, J. C. van; Klauw, K. van der; Blok, J. G. Thermodynamic properties of the normal alkanoic acids. III. Enthalpies of vaporization and vapour pressures of 13 normal alkanoic acids 791

NOTES

Jochems, R.; Dekker, H.; Mosselman, C.; Somsen, G. Enthalpies of sublimation of bicyclo[3.3.1]non-2-ene, bicyclo[3.2.2]non-6-ene, and bicyclo[4.2.1]non-3-ene 799

Katzenski, G.; Schneider, G. M. Excess volumes of liquid *n*-alkane binaries from 10 to 200 MPa at 298.15 K 801

Katzenski, G.; Schneider, G. M. Excess volumes of (ethanol + methylcyclopentane) from 10 to 200 MPa at 298.15 and 323.15 K . . 803

Number 9, September 1982

A Report of IUPAC Commission I.2 on Thermodynamics. Notation for states and processes, significance of the word "standard" in chemical thermodynamics, and remarks on commonly tabulated forms of thermodynamic functions. 805

MENTZER, R. A.; GREENKORN, R. A.; CHAO, K. C. Bubble pressures and vapor–liquid equilibria for four binary hydrocarbon mixtures . . . 817

LETCHER, T. M.; SCOONES, B. W. The excess enthalpies of 1,2,3,4-tetrahydronaphthalene + each of four *n*-alkanes and + each of four cycloalkanes at two temperatures 831

MCCARTY, R. D. Mathematical models for the prediction of liquefied-natural-gas densities 837

MAHL, B. S.; MALHOTRA, R.; KOONER, Z. S. Excess volumes and excess enthalpies of di-isopropyl ether with aromatic hydrocarbons . . . 855

WHITE, M. A.; STAVELEY, L. A. K. The heat capacity of $(CH_2{=}CHCH_2NH_3)_2CdCl_4$. The influence of the carbon–carbon double bond on the structural phase transitions 859

BYSTRÖM, K. The stabilization energy of 1,3,5-triazine derived from measurements of the enthalpies of combustion and sublimation . . 865

TRESZCZANOWICZ, A. J.; HANDA, Y. P.; BENSON, G. C. Excess volumes and isentropic compressibilities of decan-1-ol + 2,2-dimethylbutane and + 2,2,4-trimethylpentane 871

CORDFUNKE, E. H. P., OUWELTJES, W.; BARTEN, H. Standard enthalpies of formation of uranium compounds. IX. Anhydrous uranyl arsenates . 883

WEINTRAUB, R.; APELBLAT, A.; TAMIR, A. Enthalpies of solution of rubidium halides in water 887

HATEM, G.; GAUNE-ESCARD, M. Excess enthalpies of the charge-asymmetric reciprocal molten salt mixtures: $\{LiF + K_2SO_4\}$ and $\{KF + Li_2SO_4\}$. 893

CIBULKA, I.; DUBNOVÁ, J.; HOLUB, R. Excess volumes of (tetrachloromethane + a cycloalkane) and (trichloromethane + a cycloalkane) at 298.15 K . 901

Number 10, October 1982

GILL, S. J.; WADSÖ, I. Flow-microcalorimetric techniques for solution of slightly soluble gases. Enthalpy of solution of oxygen in water at 298.15 K 905

SETA, K.; NAITO, K. Calorimetric study of the phase transition in NbO_2 . 921

SETA, K.; NAITO, K. Calorimetric study of the phase transition in doped NbO_2 937

PINTOS, M.; BRAVO, R.; PAZ ANDRADE, M. I.; PEREZ VILLAR, V. Excess enthalpies of (*n*-alkanol + dipropylether), (*n*-alkanol + 1,2-diethoxyethane), and (*n*-alkanol + 2-ethoxyethanol) at 298.15 K. . . . 951

BEYER, R. P.; BROWN, R. R.; BENNINGTON, K. O.; FERRANTE, M. J. Heat capacity from 5 to 300 K of α- and β-TiO, relative enthalpy to 1200 K, enthalpy of transition, and thermodynamic properties to 1265 K . . 957

SARBAR, M.; COVINGTON, A. K.; NUTTALL, R. L.; GOLDBERG, R. N. The activity and osmotic coefficients of aqueous sodium bicarbonate solutions 967

TAKAHASHI, Y.; NAKAMURA, J.-I.; SMITH, J. F. Laser-flash calorimetry. III. Heat capacity of vanadium from 80 to 1000 K 977

RUBIO, R. G.; RENUNCIO, J. A. R.; DIAZ PEÑA, M. Excess Gibbs energies of (benzene + *n*-pentadecane) at 298.15 and 323.15 K 983

DRAEGER, J. A.; SCOTT, D. W. Chemical thermodynamic properties and internal rotation of methylpyridines. IV. Ideal-gas properties of the dimethylpyridines 991

DRAEGER, J. A. Chemical thermodynamic properties and internal rotation of methylpyridines. V. Ideal-gas properties of 2,4,6-trimethylpyridine and 2,3,6-trimethylpyridine 999

Number 11, November 1982

BAIDAKOV, V. G.; KAVERIN, A. M.; SKRIPOV, V. P. Measurement of ultrasonic speed in stable and metastable liquid methane 1003

ROY, R. N.; GIBBONS, J. J.; BUECHTER, K.; FASZHOLZ, S. Second-stage dissociation of *N,N*-bis(2-hydroxyethyl)-2-aminoethanesulfonic acid (BES) in water + 10, + 30, and + 50 mass per cent tetrahydrofuran from 278.15 to 328.15 K 1011

HASCHKE, J. M.; DELINE, T. A. Vaporization and thermodynamic properties of samarium dicarbide and sub-stoichiometric disamarium tricarbide . 1019

OETTING, F. L.; HOLLEY, C. E., JR. The specific heat capacity of biotite . 1029

PAWLAK, Z.; BATES, R. G. Calorimetric studies of hydrogen-bond formation in propylene carbonate. I. Some hydride-bis-phenolates at 298.15 K . 1035

PAWLAK, Z.; MUKHERJEE, L. M.; BATES, R. G. Calorimetric studies of hydrogen-bond formation in propylene carbonate. II. Some cationic complexes at 298.15 K 1041

SPITERI, W. L.; LETCHER, T. M. The excess enthalpies of cycloheptane + an *n*-alkane 1047

VANDERZEE, C. E. Thermodynamic properties of solutions of a hydrolyzing electrolyte: relative partial molar enthalpies and heat capacities, solvent activities, osmotic coefficients, and solute activity coefficients of aqueous sodium carbonate 1051

WOOD, R. H.; QUINT, J. R. A relation between the critical properties of aqueous salt solutions and the heat capacity of the solutions near the critical point using a single-fluid corresponding-states theory. . . . 1069

OTT, J. B.; GOATES, J. R.; WOOLLEY, E. M.; PRIEST, J. G. (Solid + liquid) phase equilibria and enthalpy changes in (water + 2,2-dimethyl-1,3-propanediol) 1077

GRØNVOLD, F.; MEISINGSET, K. K. Thermodynamic properties and phase transitions of salt hydrates between 270 and 400 K. I. $NH_4Al(SO_4)_2 \cdot 12H_2O$, $KAl(SO_4)_2 \cdot 12H_2O$, $Al_2(SO_4)_3 \cdot 17H_2O$, $ZnSO_4 \cdot 7H_2O$, $Na_2SO_4 \cdot 10H_2O$, and $Na_2S_2O_3 \cdot 5H_2O$ 1083

NOTE

KUMARAN, M. K.; HALPIN, C. J.; BENSON, G. C. A tilting dilatometer for measurements of excess molar volumes in the very dilute regions of binary liquid mixtures 1099

Number 12, December 1982

FARBER, M.; SRIVASTAVA, R. D.; MOYER, J. W. Mass-spectrometric determination of the thermodynamics of potassium hydroxide and minor potassium-containing species required in magnetohydrodynamic power systems 1103

CHYLINSKI, K.; STRYJEK, R. Excess volumes of 1,2,3,4-tetrahydronaphthalene + *trans*- and + *cis*-bicyclo[4.4.0]decane and of quinoline + *trans*- and + *cis*-bicyclo[4.4.0]decane, + 1,2,3,4-tetrahydronaphthalene, and + *n*-hexadecane at 298.15 K 1115

HOLDER, G. D.; KAMATH, V. A. Experimental determination of dissociation pressures for hydrates of the *cis*- and *trans*-isomers of 2-butene below the ice temperature 1119

KAMINSKI, W. A.; WANG, C.-H.; TAO, L. C.; WEBER, J. H. Vapor-liquid equilibria at atmospheric pressure for quinary systems containing *n*-hexane + ethanol + methylcyclopentane + benzene and either + toluene or + methanol 1129

WOOD, R. H.; MAYRATH, J. E. Enthalpies of mixing of some aqueous electrolytes at 373.15 K. 1135

MORIYA, K.; MATSUO, T.; SUGA, H. Low-temperature adiabatic calorimeter with a built-in cryo-refrigerator 1143

DYMOND, J. H.; GLEN, N.; ROBERTSON, J.; ISDALE, J. D. (p, ρ, T) for $\{(1-x)C_6H_6 + xC_6D_6\}$ and $\{(1-x)C_6H_6 + xC_6F_6\}$ in the range 298 to 373 K and 0.1 to 400 MPa 1149

SEIFERT, H.-J.; THIEL, G. Measurement of $\Delta_f G^\circ(Na_2CdCl_4, c)$ from NaCl(c) and $CdCl_2$(c) with a galvanic cell 1159

TAKAGI, T.; TERANISHI, H. Ultrasonic speeds and thermodynamic properties of (benzene + nitrobenzene) under high pressures 1167

KRATZKE, H.; SPILLNER, E.; MÜLLER, S. Thermodynamic properties for *n*-butane. 1. The vapour pressure of liquid *n*-butane. 1175

SIDDIQI, M. A.; LUCAS, K. An isothermal high-pressure flow calorimeter. The excess enthalpy of (cyclohexane + *n*-hexane) at different pressures at 288.15, 298.15, and 313.15 K 1183

O'HARE, P. A. G.; FLOTOW, H. E.; APPELMAN, E. H. The low-temperature (5 to 310 K) heat capacity and thermodynamic functions of cesium fluoroxysulfate ($CsSO_4F$) and the standard potential at 298.15 K for the half-reaction: $SO_4F^-(aq)+2H^+(aq)+2e^- = HSO_4^-(aq)+HF(aq)$. . 1191

NOTES

BARREIROS, S. F., CALADO, J. C. G.; NUNES DA PONTE, M. The melting curve of carbon monoxide 1197

WILHELM, E.; FARADJZADEH, A.; GROLIER, J.-P. E. Excess volumes and excess heat capacities of 2,3-dimethylbutane + benzene and + toluene . . 1199

INDEX TO VOLUME 14 1201